Sovereign debt, government myopia, and the financial sector

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Financial crises have been followed by sovereign or fiscal crises

- In some cases, governments took on excess debt and deficits prior to the financial crises
    - Greece, Italy
    - United States?
- In others, governments took on excess debt and risks while rescuing failed banks or stimulating the economy
    - Ireland
    - United States?
- And, in yet others, private debts and growth slowdown engulfed governments too (Spain)

Lessons from ongoing crises

- Governments keen to expand fiscally.
  - In favor of their own vote-bank.
- Government reluctant to cut back fiscally, even in wake of mounting debt on balance-sheets.
- Sovereign debt held substantially by own banks.
- Sovereign debt used in repos/as collateral to facilitate financial transactions.
- Sovereign default will cause "collateral damage"
  - Broner-Martin-Ventura (2010), Bolton-Jeanne (2011), Gennaioli-Martin-Rossi (2011), …
- Is this why markets keep lending to sovereigns?

"Home bias" in govt bond holdings of the European financial sector
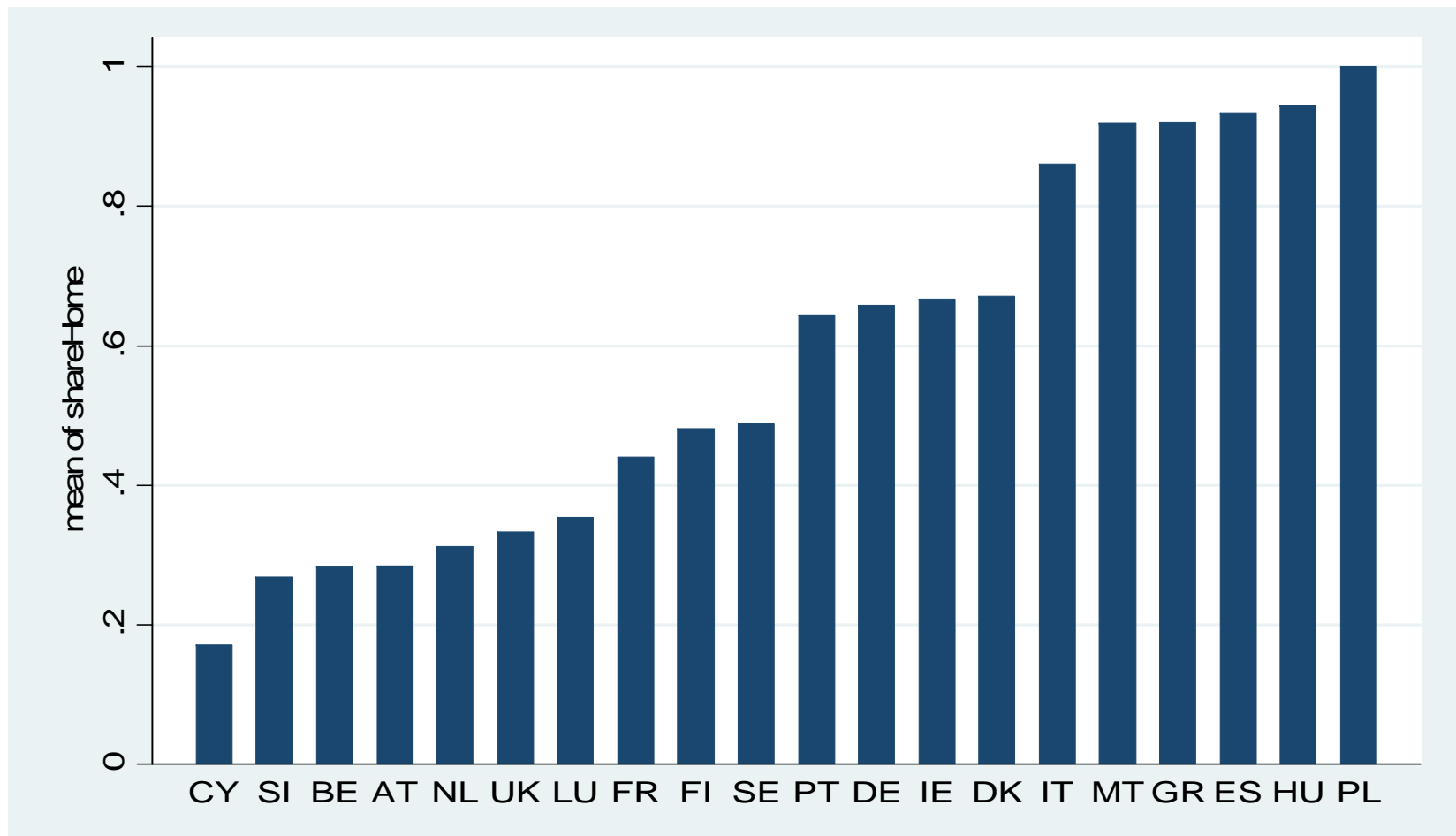
Source: Acharya, Drechsler and Schnabl (2011)

Our point

- Governments are short horizon and populist.
- They care about current cash flows.
- They will not default so long as they can borrow.
  - No net repayment
- They can pass on the burden of repaying debt to future governments.
- As their financial sectors get more entangled with sovereign debt, the costs of default increase.
- Net debt repayments are this way enforceable.
- And knowing this, creditors lend even to poor governments with low default costs.
  - Myopia may be a way for governments to commit!

Model

- Country, government, private sector, banks
- Governments have short horizon – rule for 1 period & behave as if it is their last period.
  - Want to maximize spending on populist schemes
- Period 1
  - Country enters period with legacy debt repayment due of $D_0(1+r)$
  - Can raise new debt D_1
  - Can levy taxes t_1
- Question: What D_0 is sustainable?

Model contd.

- Private sector (corporations/households)
  - Enter period with some endowment E_0
  - Chose k_1 to invest in projects keeping in mind current and prospective tax rates.
  - Rest invested in government bonds (only financial asset), e.g., as savings into a financial sector

- Taxes thus have a "crowding out" effect on private investment; conversely, a "crowding in" effect for savings and government debt

Costs of default (in period 2)

- Default disrupts domestic financial sector
- Cost of default at date 2 equals $zD_1^{Dom}(1+r)$ where

$$D_1 = D_1^{For} + D_1^{Dom}$$

- z is the *vulnerability* of the financial sector, exogenous for now; endogenized later...
- Several explanations
  - Banks may hold government bonds for liquidity and safety
  - Bonds may serve as collateral in inter-bank flows

Model timeline

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Period 1				Period 2	
t=0		t=1		t=1^+	t=2

(1) Existing foreign debt D_0 and corporate endowment E_0.	(2) Govt decides whether to announce default on legacy debt; It announces tax rate t_1; Corporate sector makes investment k_1 and saves the rest ($E_0 - k_1$)	(3) Short run corporate output $f_1(k_1)$ realized;	(4) Govt collects taxes $t_1 f_1(k_1)$; Govt repays debt of $D_0 (1+r)$ and raises new debt (if no default): Externally financed debt is D_1^{For}, domestically financed debt D_1^{Dom}.	(5) New govt comes in; Govt decides whether to announce default on legacy debt; announces tax rate t_2;	(6) Long run corporate output $f_2(k_1)$ realized; Govt collects taxes $t_2 f_2(k_1)$; Govt repays debt of $D_1 (1+r)$ (if no default)

Decisions

- Corporations/households: How much to invest in production and how much to allocate to financial savings (domestic government bonds)?
- Period 1 government
  - Whether to service legacy debt or default
  - How much to tax
  - This determines how much it will spend
- Period 2 government
  - Whether to service legacy debt or default
  - How much to tax (trivially equal to t^{Max})

Private sector investment

$$\max_{k_1} \frac{1}{(1+r)}(1-t_1)f_1(k_1) + \frac{1}{(1+r)^2}(1-t_2)f_2(k_1) - k_1.$$

- Real investment is decreasing in tax-rate => financial savings increasing in tax-rate
- Tax rate affects date-1 government's debt capacity and current spending

How much will the period 2 government repay?

- Constrained by ability to pay

$$D_1(1+r) \le t^{Max} f_2(k_1).$$

- Constrained by willingness to pay

$$D_1(1+r) \le zD_1^{Dom}(1+r).$$

- Which constraint binds?

Period 1 govt's tax policy

▸ Debt capacity

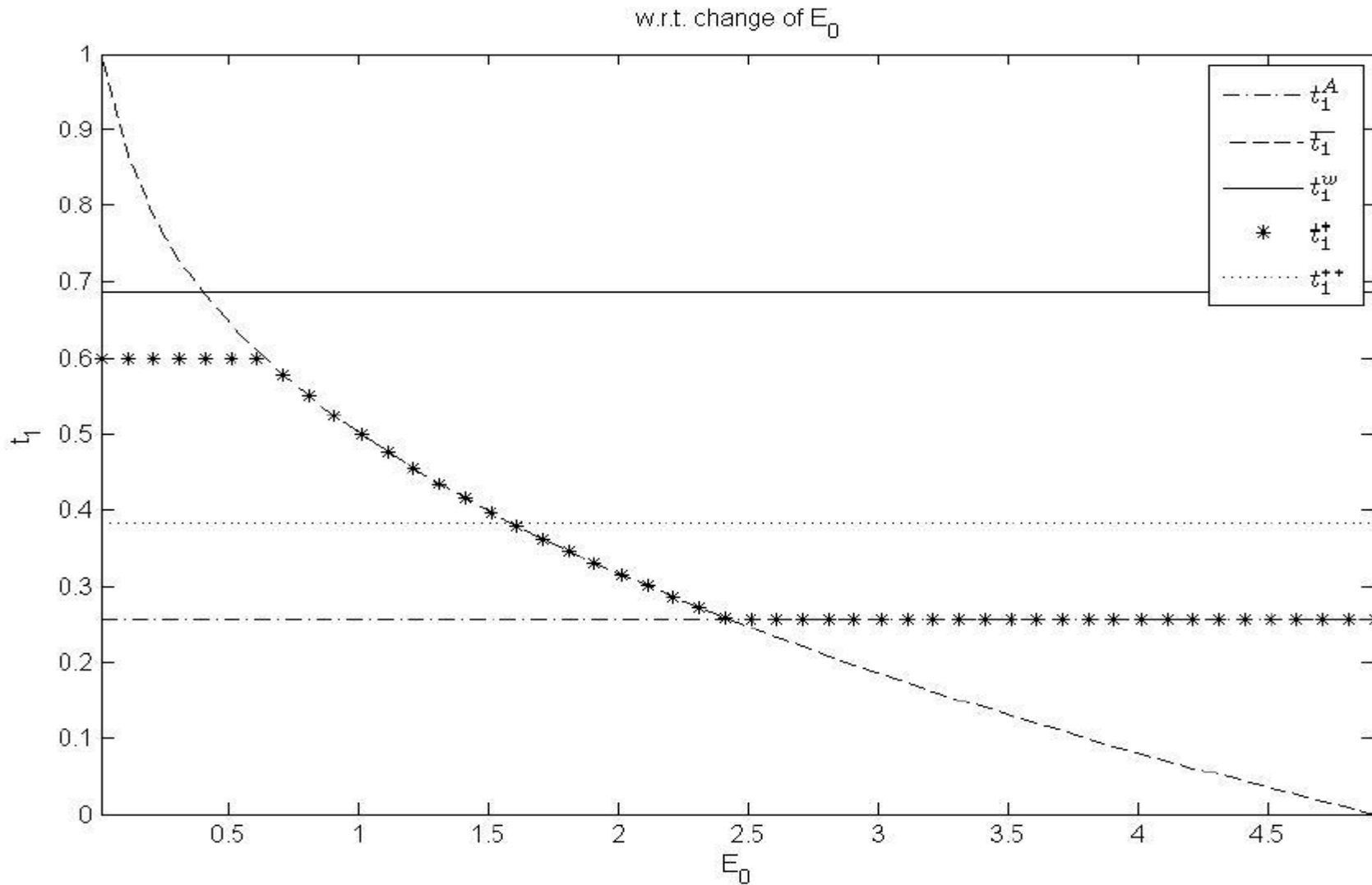$$D_1^* = \min\left[\frac{1}{(1+r)}t_2 f_2(k_1^*(t_1^*)), z\left(E_0 - k_1^*(t_1^*)\right)\right],$$

▸ In ability-to-pay region

$$\max_{t_1} t_1 f_1(k_1^*(t_1)) + \frac{1}{(1+r)}t_2 f_2(k_1^*(t_1))$$

▸ In willingness-to-pay region

$$\max_{t_1} t_1 f_1(k_1^*(t_1)) + z(E_0 - k_1^*(t_1))$$

Example: Change in optimal tax rates with endowment

Period1 government's default decision

- No-default

$$\max_{D_1, t_1} D_1 - D_0(1+r) + t_1 f_1(k_1^*(t_1))$$

- Default

$$\max_{t_1} t_1 f_1(k_1^*(t_1))$$

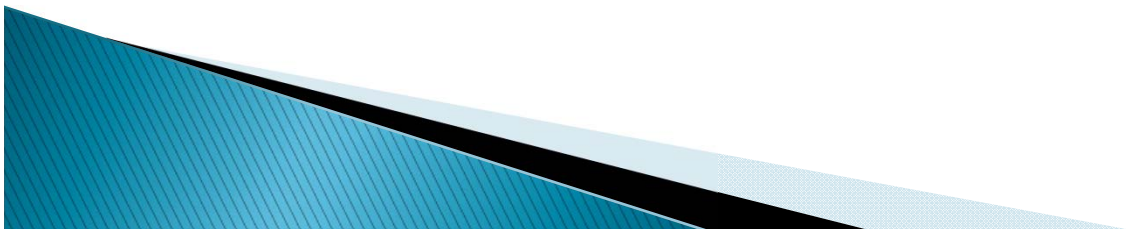- Even if prospective net borrowing, may still prefer default.
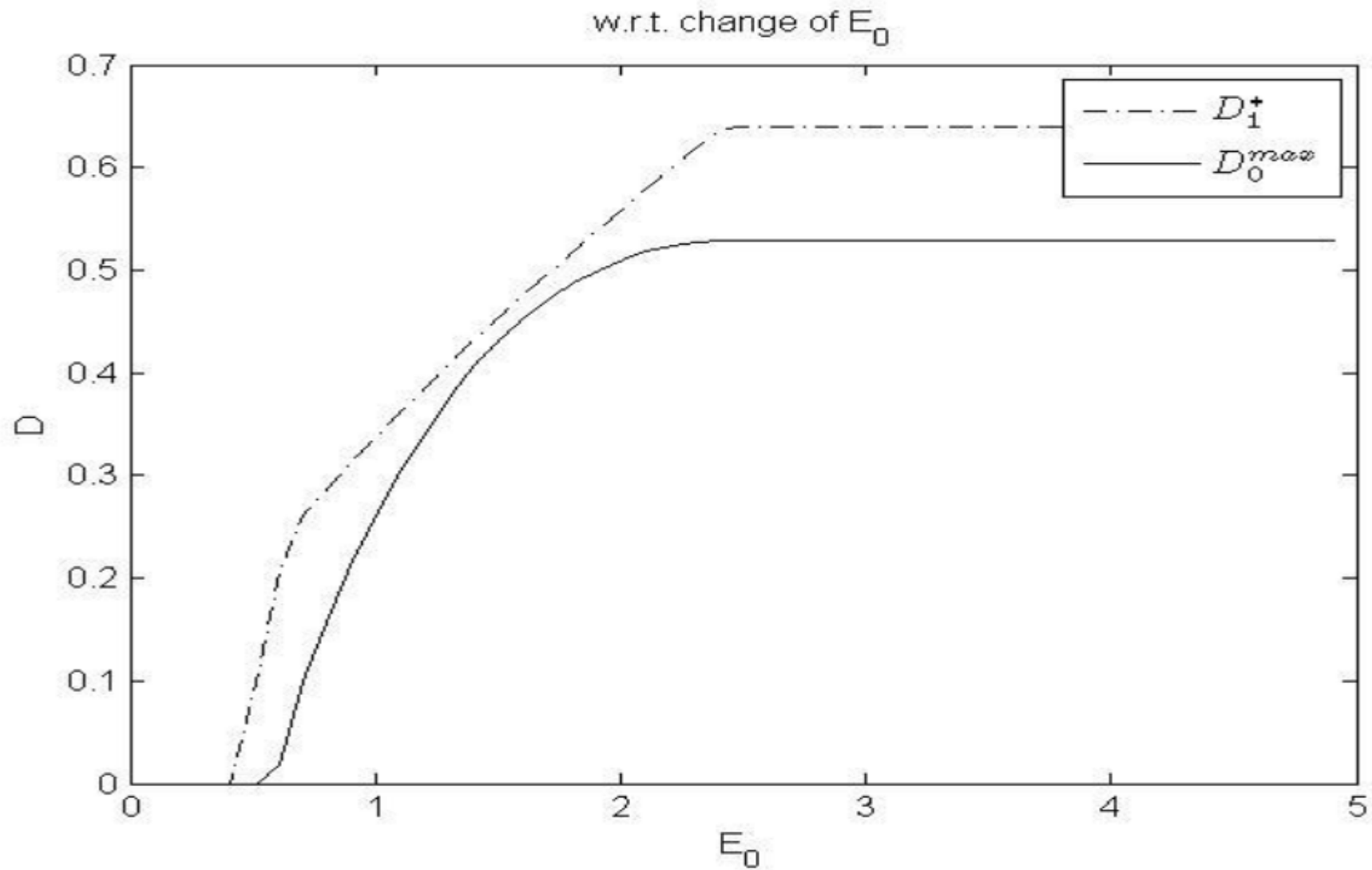
Period 1 govt's default decision

▸ Default if and only if

$$t_1^{**} f_1(k_1^*(t_1^{**})) \geq D_1^* - D_0(1+r) + t_1^* f_1(k_1^*(t_1^*)).$$

▸ Default trigger level of date-0 debt is increasing in endowment and deadweight cost of default

Example: Debt capacity w/ endowment

w.r.t. change of E_0

What about long-horizon governments?

▸ More generally, consider a government that discounts future spending using factor

$$0 < \beta \leq (1+r)^{-1}$$
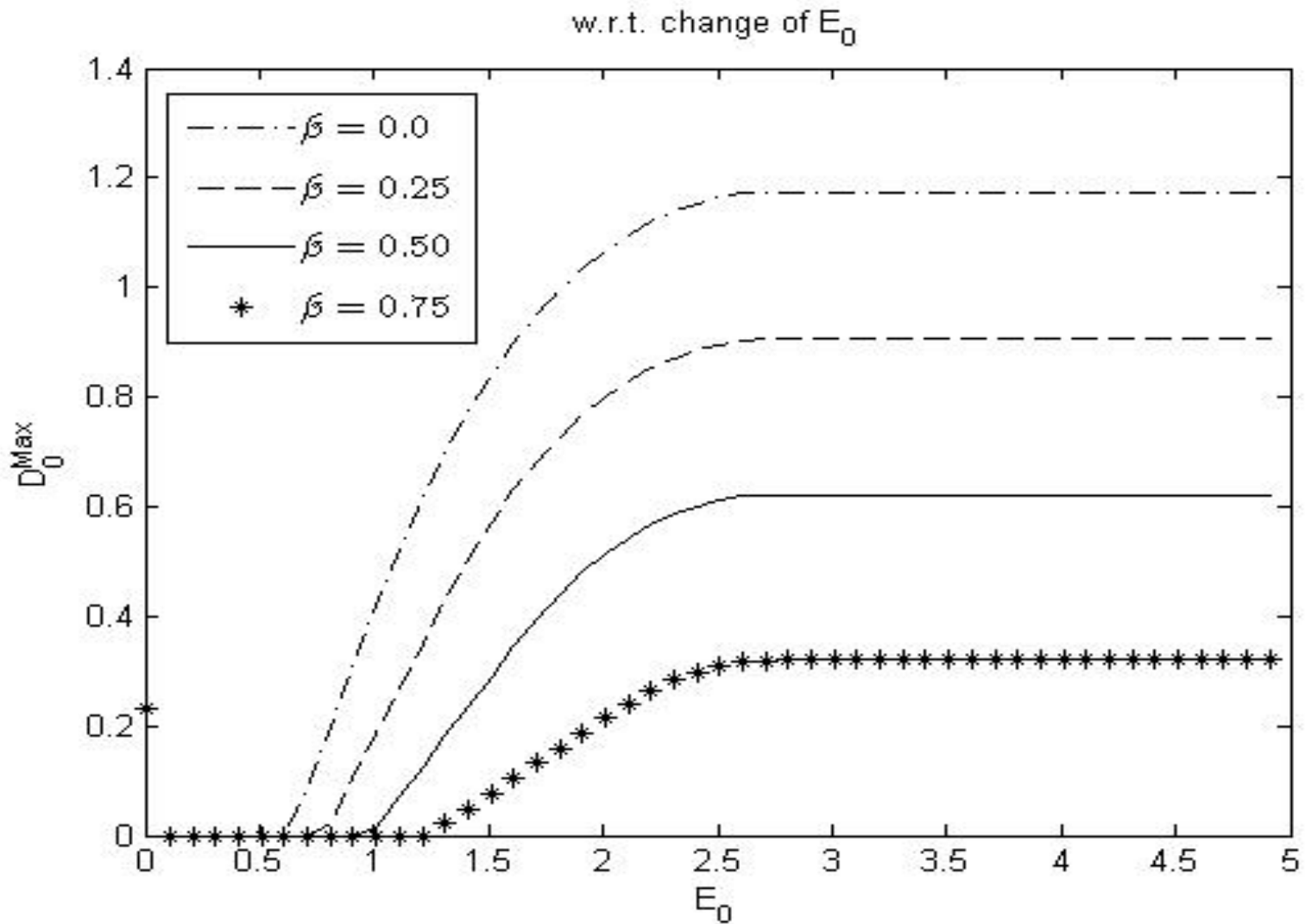
▸ Objective function:

$$\left[D_1 - D_0(1+r)\right] - \beta D_1(1+r) + t_1 f_1\left(k_1(t_1)\right) + \beta t_2 f_2\left(k_1(t_1)\right)$$

▸ If $\beta = (1+r)^{-1}$ then no value to bringing spending forward by borrowing, so it _always_ defaults on legacy debt

▸ Debt capacity is declining in β

Effect of horizon with endowment

Intuition

- Benefit of default today
  - Wipes out stock of debt before default is costly
  - Taxes don't have to be distorted to increase debt capacity
- Long-horizon government internalizes these benefits to a greater extent
- Long-horizon governments more willing to default to promote growth (or equivalently, have lower interest in, and capacity for, borrowing)
  - Short-horizon "borrowers" distort policy and grow slower
  - Short horizon governments borrow more than long horizon governments
 - What if government spending good? Is myopia good?

Choice of financial sophistication

- Countries choose the extent of "entanglement" of financial sector with govt bond markets
- Government-sponsored enterprises (GSEs)
  - Fannie Mae privatized in 1968
  - But "agency" debt maintained special status, e.g., as OMO collateral at the Fed
  - Over 50% of debt held by financial firms
  - This commitment allowed agencies to borrow
  - Commitment was upheld ex post

Entanglement of GSE debt

Holders of GSE Debt: 4Q10

Household sector 1%

Rest of the world 16%

Finance Sector 55%

Government 28%
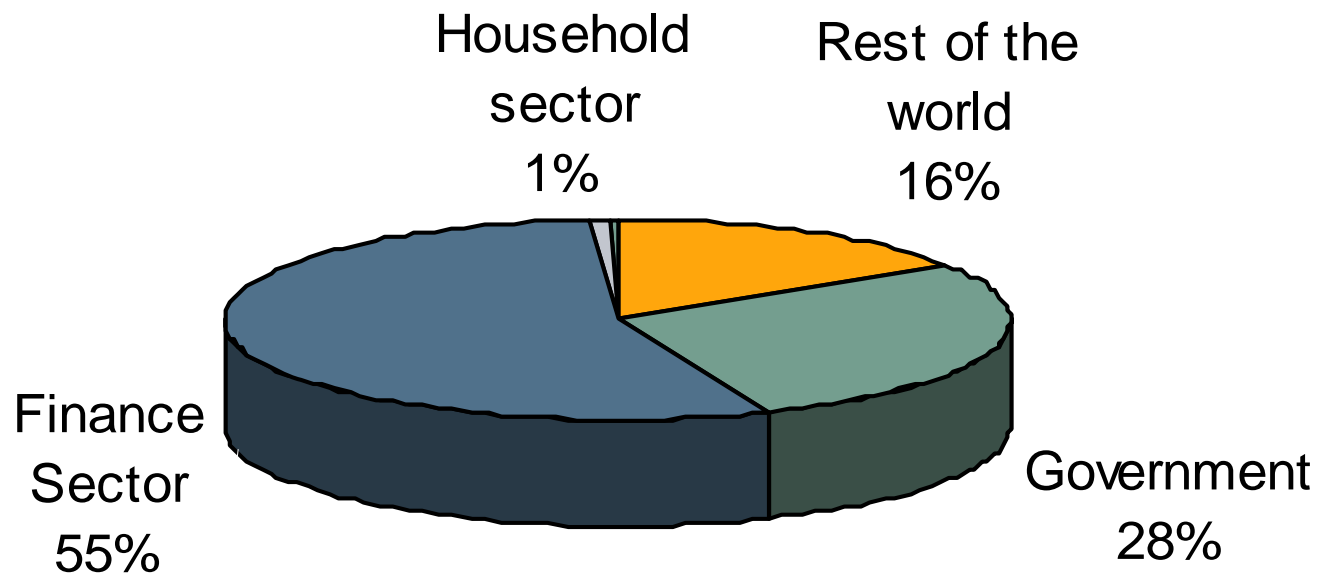
Source: Federal Reserve, Credit Sights

Choosing z

- We need to introduce uncertainty in second-period output: high w.p. q ; 0 otherwise

$$\max_{t_1,z,D_1} \left[qD_1 - D_0(1+r)\right] - \beta q D_1(1+r) - \beta(1-q)zD_1^{dom}(1+r) + t_1 f_1\left(k_1(t_1)\right) + \beta q t_2 f_2^H\left(k_1(t_1)\right)$$

- Constraints:

$$D_1(1+r) \leq \min[t_2 f_2^H, zD_1^{dom}(1+r)]$$

$$D_1^{dom} \leq [E_0 - k_1(t_1)].$$

Bond market for "wrong" reasons

- Sufficiently long–term govt $\beta \leq \dfrac{q}{1+r}$ sees no value to investment in z

- Else, boost debt capacity to the fullest so as to borrow and spend today up to ability to pay

$$D_1 = zD_1^{dom} = \frac{t_2 f_2^{H}}{1+r}$$

- Greater is $q,$ the greater the desire to borrow today (lower tax rate), and the greater is z to commit to repay

GSEs as (govt's) "shadow banks"

- The United States government created substantial "z" through creation of agency debt within a sophisticated financial sector
- Willingness to pay external creditors
- Substantial debt capacity for GSEs
- Ostensible goal to boost short-run consumption through housing subsidies
- Excessive future risk of financial sector to housing sector collapse
- Resulted in substantial financial fragility, mop-up costs

Summary

- Myopic governments increase financial sector entanglements to borrow more
  - Example: Financial repression in Europe (zero sovereign debt risk-weights)
  - Example: High liquidity requirements for domestic sovereign debt
- Increases current debt capacity
- But with uncertainty, such entanglement also increases the future cost of failure
  - Double whammy

Other Applications/Implications

- Constitutional debt limits might be valuable
- Bruegel proposal:
  - "Blue" bonds held by domestic banks and guaranteed by Euro area;
  - "Red" bonds guaranteed by issuing country and domestic banks prohibited from holding
  - Lack of commitment to repay Red bonds?
  - Can help limit excessive borrowing by short-term governments
- Dynamics?
  - Extension shows that myopia leads to excessive entanglement and sovereign debt in times of "Great Moderation", when expected short-run risks are low